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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,111	03/29/2004	J. Joseph Armstrong	KLAC0080	1534

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EXAMINER

FINEMAN, LEE A

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 08/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/812,111

Applicant(s)

ARMSTRONG ET AL.

Examiner

Joshua L. Pritchett
~~187 C.F.R. Examiner~~

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8, 9, 11, 13, 14, 17-19, 64 and 67-98 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8, 9, 11, 13, 14, 17-19, 64, 67-77 and 79-98 is/are rejected.
- 7) ☒ Claim(s) 78 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to Amendment filed June 19, 2006. Claims 1,8,67,71 have been amended, claims 7, 10, 12, 15, 16, 20-63, 65 and 66 have been cancelled and claims 75-98 have been added as requested by the applicant.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 5-6, 8, 17-18, 67, 71-73, 75, 79-81, 86, 87 and 92-94 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 43 and 45-48 of copending Application No. 10/646073. Although the conflicting claims are not identical, they are not patentably distinct from each other the claims of the instant

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application are merely broader than or an obvious variation of the claims of copending

Application No. 10/646073.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims 1, 3, 8, 9, 17-19, 67, 69, 73-75, 77, 79, 86, 87 and 94 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-2, 4, 7-9 and 11 of copending Application No. 10/434374 in view of Yonekubo, US 4,108,794 or Suwa, US 5,825,043.

Application No. 10/434374 discloses an objective constructed of a single glass material with a focusing lens, field lens and Mangin mirror element having diameters less than 25 millimeters. Application No. 10/434374 lacks the light energy going through an immersion liquid to the specimen. Immersion liquids, including water and oil, are well known in the microscope/lithography art to obtain better imaging performance. For example, Yonekubo or Suwa teach using immersion liquids, including water and oil, to obtain better imaging performance (see Yonekubo, columns 1-2 and Suwa, column 3, lines 24-33). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a immersion liquid like those taught in Yonekubo or Suwa with the objective of Application No. 10/434374 to provide better imaging performance.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 5-6, 8-9, 11, 13-14, 17-19, 64, 67, 68, 71-76, 79-89 and 91-98 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafer et al. (Henceforth Shafer '722), US 2001/0040722 A1, in view of Yonekubo or Suwa.

Regarding claims 1, 2, 13-14, 64, 67, 68, 75, 76, 84-85, 88-89, 91 and 95-98, Shafer '722 disclose an objective (fig. 3) used in wavelengths below 365 nm (abstract) for use in inspecting a specimen (309, not shown), said objective employed with light energy having a wavelength in the range of approximately 190 to 1000 nanometers (page 6, section [0082]), comprising: a focusing lens group (308) comprising at least one focusing lens (308) configured to receive said light energy and form focused light energy; a field lens (304) oriented to receive focused light energy from said focusing lens group (fig. 3) and provide intermediate light energy; and a Mangin mirror arrangement (306) positioned to receive the intermediate light energy from the field lens (fig. 3) and form controlled light energy wherein the objective is optimized to produce minimum spherical aberration, axial color, and chromatic variation of aberrations (page 7, sections [0083]-[0085]); wherein only two glass materials are used (see table 5) comprising fused silica and calcium fluoride (see table 5). Shafer '722 disclose the claimed invention except for an immersion liquid between the Mangin mirror and the specimen. Immersion liquids, including water and oil, are well known in the microscope/lithography art to obtain better

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imaging performance. For example, Yonekubo or Suwa teach using immersion liquids, including water and oil (which has a refractive index greater than water), to obtain better imaging performance (see Yonekubo, columns 1-2 and Suwa, column 3, lines 24-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a immersion liquid like those taught in Yonekubo or Suwa with the objective of Shafer '722 to provide better imaging performance. Therefore, the immersion liquid would be between the Mangin mirror and the specimen. Regarding claims 2, 13, 14 and 68, in as much as the claims are able to be understood in light of the 35 U.S.C 112 rejection made above the rejection applies.

Regarding claims 8, 73, 79 and 93, Shafer '722 further disclose wherein each lens used in the objective has a diameter of less than approximately 25 millimeters (fig. 3).

Regarding claims 9, 11, 74 and 82-83, Shafer '722 further disclose wherein all lenses are constructed of a single glass material that is fused silica (page 6, section [0082]).

Regarding claims 5, 6, 71-72, 80-81 and 92, Shafer '722 further disclose said objective (fig. 3) configured to have a numerical aperture in excess of approximately 0.9 or 1.1 (page 7, section [0085]).

Regarding claims 17-18, 86-87 and 94, Shafer '722 in view of Yonekubo or Suwa as disclosed above further disclose said objective having a long working distance used with a microscope (figs. 1 and 2) having a flange (at 102 or 202) but is silent as to the location of the flange being approximately 45 millimeters from the specimen or at least approximately 100 millimeters from the specimen. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the flange be approximately 45 millimeters from the specimen or at least approximately 100 millimeters from the specimen, since it has been held that

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discovering an optimum value of a result effective variable involves only routine skill in the art. One would have been motivated to have the flange be approximately 45 millimeters from the specimen or at least approximately 100 millimeters from the specimen for the purpose of having an appropriate working area for interacting with/changing the specimen. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 19, Shafer '722 further disclose wherein said focusing lens and field lens form an intermediate image between said field lens and said Mangin mirror arrangement (fig 3).

Claims 1-3, 13-14, 64, 67-69 and 75-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafer et al., US 5,717,518 (henceforth Shafer '518) in view of Yonekubo or Suwa.

Regarding claims 1, 2, 13-14, 64, 67, 68 and 75-76, Shafer '518 disclose an objective (fig. 1) for use in inspecting a specimen (column 2, lines 39-42, not shown), said objective employed with light energy having a wavelength in the range of approximately 190 to 1000 nanometers (column 4, lines 10-34), comprising: a focusing lens group (11) comprising at least one focusing lens (21) configured to receive said light energy and form focused light energy; a field lens (15) oriented to receive focused light energy from said focusing lens group (fig. 1) and provide intermediate light energy; and a Mangin mirror arrangement (17) positioned to receive the intermediate light energy from the field lens (fig. 1) and form controlled light energy. Shafer '518 disclose the claimed invention except for an immersion liquid between the Mangin mirror

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and the specimen. Immersion liquids, including water and oil, are well known in the microscope/lithography art to obtain better imaging performance. For example, Yonekubo or Suwa teach using immersion liquids, including water and oil (which has a refractive index greater than water), to obtain better imaging performance (see Yonekubo, columns 1-2 and Suwa, column 3, lines 24-33). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a immersion liquid like those taught in Yonekubo or Suwa with the objective of Shafer '518 to provide better imaging performance. Therefore, the immersion liquid would be between the Mangin mirror and the specimen. Regarding claims 2, 13, 14 and 68, in as much as the claims are able to be understood in light of the 35 U.S.C 112 rejection made above the rejection applies.

Regarding claim 3, 69 and 77, Shafer '518 further disclose wherein said Mangin mirror arrangement comprises a concave lens/mirror element (39) having substantially curved concave surfaces and second surface reflectivity (41); and a relatively flat lens/mirror element (43) having minimally curved surfaces and second surface reflectivity (45).

Claims 4 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shafer '518 in view of Yonekubo or Suwa, as applied to claims 3 or 69 above, and further in view of Hamblen, US 5,159,495.

Shafer '518 in view of disclose Yonekubo or Suwa as applied to claims 3 or 69 above disclose the claimed invention except for wherein said Mangin mirror arrangement further comprises a third lens having one surface in contact with the immersion liquid. Hamblen teaches in fig. 3 a catadioptric system including a Mangin mirror arrangement that also includes an

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optional third lens (40, column 55-60) closest to the sample (fig. 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a third lens as taught by Hamblen to the Mangin mirror arrangement of Shafer '518 in view of disclose Yonekubo or Suwa to further help focus the light energy rays (Hamblen, column 55-60). Therefore, this lens, as the closest would have one surface in contact with the immersion liquid.

Allowable Subject Matter

Claim 78 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach or suggest the Mangin mirror comprising a third element have one surface in contact with the immersion liquid.

Response to Arguments

Applicant's arguments filed June 19, 2006 have been fully considered but they are not persuasive.

Applicant argues the additional restriction presented in the previous office action is improper. The examiner did not further restrict the claims but merely disagreed with the claims applicant attributed to the elected Species.

Applicant argues the claims of copending application 10/434,374 do not include an immersion liquid and therefore the double patenting rejection is improper. The examiner has set forth the double patenting rejection above to show that the use of an immersion liquid is obvious and there is a motivation for one of ordinary skill in the art to use an immersion liquid. The motivation provided in the rejection is to provide better imaging performance. The better imaging performance is achieved through the use of refractive index matching to limit the amount of reflection at the interface of two materials with different refractive indices and thus maximize the intensity of the light passing through the optical system to provide an image that is brighter to the observer.

Applicant argues the device formed by the combination Shafer, Yonekubo or Suwa would be a poor image and inadequate inspection in the environment claimed. The prior art combination teaches all the structural limitations of the claimed invention and therefore would perform the functional limitations to the standards of claimed invention. Applicant argues Shafer provides no suggestion to use an immersion liquid. The Yonekubo and Suwa reference teach the immersion liquid and the knowledge of one of ordinary skill in the art suggests the use of the immersion liquid. Therefore absent some other limitation on the immersion substance the prior art satisfies the claimed limitations.

Applicant argues these reference are materially diverse and each reference does not suggest employing the features disclosed in any of the other references. The reference does not have to explicitly provide a suggestion for combination. It is extremely well known in the art that immersion substances are used to provide refractive index matching between an objective and a specimen to prevent reflections at interfaces due to large refractive index differences. The

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knowledge of one of ordinary skill in the art can be used as a suggestion and motivation to combine references to form a proper rejection.

Applicant argues the stated motivation to combine Shafer and Yonekubo or Suwa of providing better image performance is not a motivation but a conclusory statement. The motivation to combine comes from the knowledge of one of ordinary skill in the art that immersion substances can reduce reflections that produce unwanted glare that obscure and deteriorate the image provided to the observer.

Applicant argues the examiner used hindsight to construct the rejection. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Applicant argues the light energy does not enter the back side of the mangin mirror of Shafer. The claim language provides no point from which to determine which surface "a back side" must refer. Therefore the examiner's interpretation is reasonable based on the claim language. The examiner points out this limitation has been amended to now require the light to pass completely through (from a back side through to a front side) which is taught by Allan as stated in the rejection above.

Applicant argues it is unclear what type of objective would result from a mangin mirror wherein light energy passes through a back side thereof in a design such as Shafer however it is

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unlikely to provide any type of usable inspection system. The applicant presents no evidence that the combination does not work and the statement that the system would not be usable is a mere conclusion without any evidence provided as support.

Applicant argues the issue is whether the references as a whole suggest the particular combination being used to rejection the claims. The references are read in light of the knowledge of one of ordinary skill in the art therefore the references as a whole include the knowledge of one of ordinary skill in the art. As stated above the motivations for the combinations provided come from the knowledge of one of ordinary skill in the art. Therefore the rejections are proper.

Applicant's arguments, see Amendment, filed June 19, 2006, with respect to objection to the drawings have been fully considered and are persuasive. The objection of the drawings has been withdrawn.

Applicant's arguments, see Amendment, filed June 19, 2006, with respect to the 35 U.S.C. 112 rejection have been fully considered and are persuasive. The 35 U.S.C. 112 rejection has been withdrawn.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joshua L. Pritchett whose telephone number is 571-272-2318. The examiner can normally be reached on Monday - Friday 7:00 - 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew A. Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Joshua L Pritchett
Examiner
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DREW A. DUNN
SUPERVISORY PATENT EXAMINER